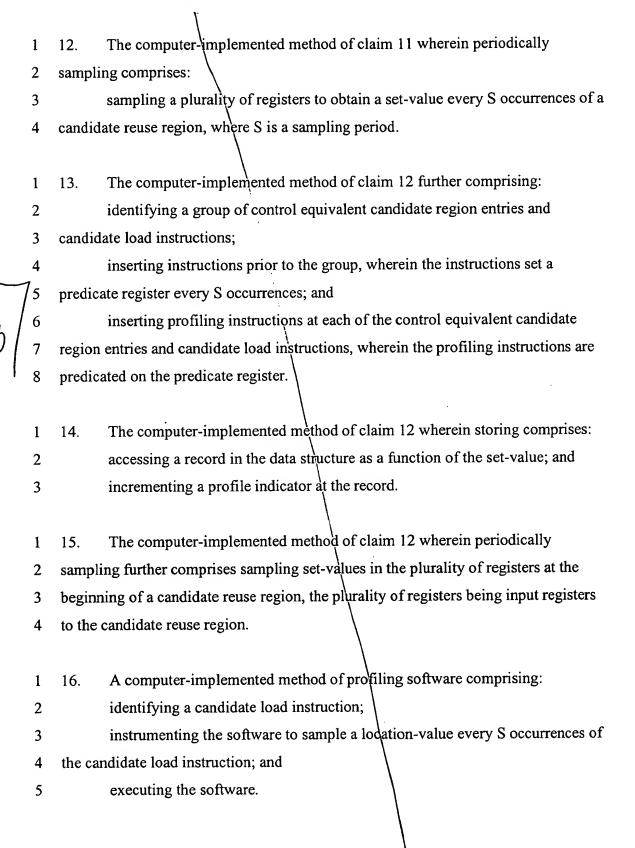
What is claimed is:

- 1 1. A computer-implemented method of profiling software comprising:
- 2 identifying a candidate reuse region;
- determining an input set for the candidate reuse region;
- 4 instrumenting the software to profile set-values for the input set; and
- 5 executing the instrumented software.
- 1 2. The computer-implemented method of claim 1 further comprising:
- 2 identifying a candidate load instruction within the candidate reuse region; and
- instrumenting the software to profile location-values for the candidate load
- 4 instruction.
- 1 3. The computer-implemented method of claim 1 wherein the input set
- 2 comprises a plurality of input registers, and each set-value comprises an input
- 3 register value for each of the plurality of input registers, the method further
- 4 comprising:
- for each set-value, combining each of the input register values into a single
- 6 value.
- 1 4. The computer-implemented method of claim 3 wherein combining
- 2 comprises:
- folding each of the input register values to create folded values; and
- 4 concatenating the folded values.
- 1 5. The computer-implemented method of claim 1 wherein instrumenting
- 2 comprises inserting instructions to periodically sample set-values.
- 1 6. The computer-implemented method of claim 5 wherein the input-set
- 2 comprises a plurality of input registers, and each set-value comprises an input

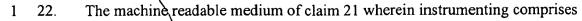
register value for each of the plurality of input registers, and wherein instrumenting 3 4 further comprises: inserting instructions to combine each of the input register values into a 5 6 single value; and inserting instructions to index into a data structure of profile indicators using 7 the single value. 8 The computer implemented method of claim 5 wherein instrumenting further 1 7. 2 comprises: inserting instructions to profile the top N occurring set-values, where N is 3 chosen as a function of an expected number of reuse instances. The computer-implemented method of claim 1 further comprising selecting 8. 1 2 the candidate reuse region as a computation reuse region. A machine readable medium including instructions for a method of profiling 9. 1 2 software, the method comprising: 3 identifying a candidate reuse region; determining an input set for the candidate reuse region; 4 instrumenting the software to profile set-values for the input set; and 5 executing the instrumented software 6 The machine readable medium of claim 9 wherein instrumenting comprises: 1 10. inserting instructions to periodically sample set-values. 2 A computer-implemented method of profiling software comprising: 1 11. periodically sampling registers to obtain register values; and 2

storing an occurrence frequency of the register values in a data structure.

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The computer-implemented method of claim 16 wherein instrumenting 17. 1 2 comprises: inserting instructions in the software to count the number of times each 3 location-value is sampled; and 4 inserting instructions in the software to keep track of top location-values. 5 The computer-implemented method of claim 16 further comprising: identifying a group of control equivalent candidate region entries and 2 candidate load instructions; inserting instructions prior to the group, wherein the instructions set a 5 predicate register every S occurrences; and inserting profiling instructions at each of the control equivalent candidate 6 region entries and candidate load instructions, wherein the profiling instructions are 7 8 predicated on the predicated register. The computer-implemented method of claim 17 wherein the candidate region 1 19. includes a plurality of candidate load instructions, each of the plurality of load 2 instructions being predicated on a common predicate register. 3 The computer-implemented thethod of claim 17 wherein inserting 1 20. instructions to keep track of top location-values includes inserting sampling 2 instructions configured to profile the top N occurrences of location-values, where N 3 is an integer. A machine readable medium including instructions for a method of profiling 1 21. 2 software, the method comprising: identifying a candidate load instruction; 3 instrumenting the software to sample a location-value every S occurrences of 4 the candidate load instruction; and 5 6 executing the software.



- 2 inserting instructions in the software to count the number of times each location-
- 3 value is encountered.
- 1 23. A computer-implemented method of selecting reuse regions within a software
- 2 program, the method comprising:
- profiling top set-values for candidate reuse regions to produce a probability of top set-values; and
- selecting reuse regions as a function of the probability of top set-values.
- 1 24. The computer-implemented method of claim 23 wherein profiling set-values
- 2 comprises:
- 3 representing each top set-value as a single value; and
- 4 accessing a data structure as a\function of the single value to modify a profile
- 5 indicator.
- 1 25. The computer-implemented method of claim 24 wherein accessing a data
- 2 structure comprises accessing a data structure at least as large as a number of
- 3 expected reuse instances.
- 1 26. The computer-implemented method of claim 25 wherein selecting comprises
- 2 marking as reuse regions those candidate reuse regions having a finite number of top
- 3 set-values that have a probability of occurrence greater than a threshold.
- 1 27. A machine readable medium including instructions for a method of selecting
- 2 reuse regions within a software program, the method comprising:
- 3 profiling top set-values for candidate reuse regions to produce a probability of
- 4 top set-values; and
- 5 selecting reuse regions as a function of the probability of top set-values.

1 28. The machine readable medium of claim 27 wherein profiling set-values
2 comprises:
3 representing each top set-value as a single value; and
4 accessing a data structure as a function of the single value to modify a profile

5 indicator.

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